of said fixed eccentric weight and 2) a second angular position in which the eccentricity of said rigid free swinging eccentric weight detracts from the eccentricity of said fixed eccentric weight, wherein said rigid free swinging eccentric weight is mounted on said exciter shaft so as to be restrained from substantial axial movement along said exciter shaft without the use of any retaining structure that is fixed to said free swinging eccentric weight,

wherein said rigid free swinging eccentric weight is restrained from substantial axial movement along said exciter shaft solely by two separate exciter components that are individually fixed to said exciter shaft on opposite sides of said free swinging eccentric weight in a non-abutting relationship relative to one another.

Please cancel claim 24.

REMARKS

Entry of the amendments is respectfully requested. Claims 1, 4, 12, 25, 27, and 31 have been amended. Claim 24 has been canceled. Claims 1-23 and 25-31 are pending in the application. Favorable reconsideration and allowance of this application is respectfully requested in light of the foregoing amendments and the remarks that follow.

1. Rejection Under §112, Second Paragraph

Claims 12-13 and 24-31 stand rejected under 35 U.S.C. §112, ¶2 as being indefinite. Claim 12 was amended as follows:

"(E) a second free swinging eccentric weight 1) which is sandwiched between a second end of said fixed eccentric weight and a component" to address the error pointed out by the Examiner. Claim 13 depends from claim 12.

Claim 24 was canceled, thereby obviating this rejection. Claims 25 and 26 were amended to change their dependency from canceled claim 24 to allowed claim 20.

Claim 27 was amended to delete "without using any hardware" and "without using any mounting hardware". Claims 28-30 depend from claim 27.

Claim 31 stands rejected because it is allegedly confusing due to the recitation of "two separate exciter components" and "the free swinging weight is restrained from axial movement by being between the fixed weight and one of a bearing or torque transfer element." The Examiner contends that the fixed weight is considered as both the fixed weight and one of the two separate exciter components. The Applicants respectfully traverse this rejection because the fixed weight *may* or *may not* be one of the two separate exciter components. For example, the rigid free swinging eccentric weight can be restrained by the fixed weight and another fixed weight, by the fixed weight and a bearing, by the fixed weight and a gear, or by the fixed weight and another torque transfer element. The Examiner's interpretation is improper because it necessarily equates the claims with the preferred embodiment. However, it is well settled that the claims are not limited by the preferred embodiment disclosed in the patent application. *See Rexnord Corp. v. The Laitram Corp.*, 274 F.3d 1336, 1344, 60 USPQ2d 1851, 1855 (Fed. Cir. 2001). Furthermore, breadth of a claim is not to be equated with indefiniteness. *See In re Miller*, 441 F.2d 689, 169 USPQ 597 (CCPA 1971). If the scope of the subject matter

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embraced by the claims is clear, and if applicants have not otherwise indicated that they intend the invention to be of a scope different from that defined in the claims, then the claims comply with 35 U.S.C. §112, second paragraph. MPEP §2173.04. Accordingly, this cited language does *not* render claim 31 indefinite under 35 U.S.C. §112, ¶2.

These amendments in no way are believed to narrow the scope of the claims and are for clarification purposes only. In light of the amendments and the foregoing arguments, withdrawal of this rejection is requested.

2. Rejections Based on the Prior Art

a. Recapitulation of the Invention[1]

The invention relates to a lightweight, easy to assemble, and compact exciter assembly for a compaction device such as a drum assembly of a vibratory trench roller or another vibratory compactor. The exciter assembly includes a fixed weight and one or more free swinging weights that can be mounted on an exciter shaft, without using any mounting hardware, so as to hold the free swinging weights axially in position while permitting them to swing between first and second angular positions on the exciter shaft. Preferably, the fixed weight is mounted on a central portion of the exciter shaft, and two free swinging weights are mounted adjacent the ends of the fixed weight so as to be restrained from substantial sliding movement along the exciter shaft solely by the fixed weight and other operative components of the exciter assembly, such as bearings and/or gears or other torque transfer elements. The reduction in length afforded by this design

[1] This Section 2a is intended to provide the Examiner with some background information on the state of the art applicants' contribution to it. It is *not* intended to distinguish specific claim for the prior art. That task is performed in Section 2b below.

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permits a reversible hydraulic motor to be mounted coaxially on the end of the exciter shaft without unacceptably increasing the overall length of a drum assembly, thereby further simplifying the machine's assembly and facilitating maintenance or repair of the machine.

b. Rejection Under § 103(a)

i. Rejection of Claims 1, 5, 8, and 31

The rejection of claims 1, 5, 8, and 31 as unpatentable over Stanton (U.S. Patent No. 4,586,847) in view of Martinez (U.S. Patent No. 3,892,496) is respectfully traversed as they may be applied against amended claims 1 and 31, because, *inter alia*, there is no teaching or suggestion to combine or modify the references to produce the claimed invention. MPEP §2143.01. The Examiner correctly recognizes that Stanton fails to show a rigid free swinging eccentric weight mounted on the exciter shaft so as to rotate with respect to the exciter shaft between a first angular position in which the eccentricity of the free swinging weight adds to the eccentricity of the fixed weight and a second angular position in which the eccentricity of the free swinging weight detracts from the eccentricity of the fixed weight, wherein axial movement along said exciter shaft without the use of any retaining structure that is fixed to said free swinging weight. The Examiner cites Martinez to cure this deficiency.

Claim 1 has been amended to require

> wherein said rigid free swinging eccentric weight is disposed between an axial end of said fixed eccentric weight and another component of said exciter assembly that is fixed to said exciter shaft, and wherein said rigid free

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swinging weight is restrained from substantial axial movement along said exciter shaft solely by said fixed eccentric weight and said another component of said exciter assembly.

The combined teachings of Stanton and Martinez fail to disclose or suggest a rigid free swinging eccentric weight that is "disposed between an axial end of said fixed eccentric weight and another component of said exciter assembly that is fixed to said exciter shaft," as is required by amended claim 1.

Instead, Stanton lacks a rigid free swinging weight, and the Martinez discloses a vibrating roller that includes an outer body 2 that has an additional massive body 3, which are mounted on a shaft 1. The outer body 2 defines inside thereof a housing for bodies 3. That is, body 3 is located *within* outer body 2. Consequently, the additional massive body 3 is not disposed between an axial end of the fixed eccentric weight and a second axial end disposed adjacent another component of the exciter assembly that is fixed to the exciter shaft. Thus, even if the references were combined, the combination would lack a free swinging eccentric weight that is "disposed between an axial end of said fixed eccentric weight and a second axial end disposed adjacent another component of said exciter assembly that is fixed to said exciter shaft."

Furthermore, amended claim 1 is non-obvious over Stanton in view of the embodiment shown in Figure 6 of Martinez. As is explained in detail below, the shoes 14 of Martinez are not fixed to the exciter shaft and Martinez' free swinging eccentric weight therefore is not restrained from substantial axial movement along said exciter shaft solely by said fixed eccentric weight and said another component of said exciter assembly."

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Dependent claims 5 and 8 are believed to be in condition for allowance for incorporating by reference the limitations of claim 1 and for defining additional features of the invention, which, when considered in combination with those of claim 1, are neither disclosed nor suggested by the prior art relied upon in the rejection.

Claim 31 has been amended to require

> wherein said rigid free swinging eccentric weight is restrained from substantial axial movement along said exciter shaft solely by two separate exciter components that are individually ~~mounted~~fixed to said exciter shaft on opposite sides of said free swinging eccentric weight in a non-abutting relationship relative to one another.

The combined teachings of Stanton and Martinez fail to teach or suggest an exciter assembly for a vibratory roller that has a rigid free swinging eccentric weight that is configured as is required by amended claim 31. Although the embodiment depicted in Figure 6 of Martinez shows a free swinging-weight 12 sandwiched between two separate components, namely the shoes 14, the combined teachings of Stanton and Martinez fail to teach or suggest a rigid free swinging eccentric weight that is restrained from substantial axial movement along the exciter shaft *solely* by two separate exciter components that are *individually fixed* to the exciter shaft on opposite sides of the free swinging eccentric weight in a non-abutting relationship relative to one another.

Instead, as is shown in Figure 6, springs 15 urge the shoes 14 of Martinez against an inner mass 12 to provide the frictional force necessary for the driving engagement, by making the same rigid with one another up to a determined frequency, with a subsequent sliding therebetween when the centrifugal force generated in the idly rotating mass 12 on

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the driving shaft 1 is higher than the frictional force, thus avoiding violent shocks. (col. 3, lines 19-25). Hence, the shoes 14 are not fixed to the exciter shaft as claimed.

In light of the amendments and the foregoing, withdrawal of the rejection of claims 1, 5, 8, and 31 is requested.

ii. Rejection of Claims 6 and 7

The rejection of Claims 6 and 7 as unpatentable over Stanton in view of Martinez is respectfully traversed as they may be against claims 6 and 7, which depend from amended claim 1, because, *inter alia*, there is no teaching or suggestion to combine or modify the references to produce the claimed invention. MPEP §2143.01. The Examiner correctly recognizes that Stanton as modified by Martinez fails to show a motor having a rotary output shaft which is coupled to the exciter shaft and which is co-axial with exciter shaft, the motor output shaft being splined directly to the exciter shaft. The Examiner then cites Century to cure this deficiency.

Nevertheless, even if the references were combined as proposed by the Examiner, Century cannot cure the aforementioned deficiencies in the teachings. In light of the amendments and the foregoing, withdrawal of the rejection of claims 6 and 7 is requested.

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3. Allowable Claims and New Claim

The applicants gratefully acknowledge the indication that claim 4 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

In addition, the applicants gratefully acknowledge the indication that claims 2-3, 9-11, and 14-23 are allowed.

Additionally, the applicants acknowledge the indication that claims 13, 24-26, and 28-30 would be allowable if they are amended to overcome the rejections under 35 U.S.C. §112, second paragraph and to include all of the limitations of the base claim and any intervening claims. The claims have been so amended or canceled (claim 24) to overcome the 35 U.S.C. §112 rejection. Claim 13 depends from claim 12, which has been indicated as being allowable if amended to overcome the rejection under 35 U.S.C. §112. Claim 12 has been so amended. Claim 24 has been canceled. Claims 25 and 26 were amended to depend from claim 20, which has been indicated as being allowed. Claims 28-30 depend from claim 27, which has been indicated as being allowable if amended to overcome the rejection under 35 U.S.C. §112. Claim 27 has been so amended.

The applicants also acknowledge the indication that claims 12 and 27 would be allowable if amended to overcome the rejection under 35 U.S.C. §112. Claims 12 and 27 have been amended to overcome this rejection.

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CONCLUSION

It is submitted that original claims 1-23 and 25-31 are in compliance with 35 U.S.C. §§ 112 and 103 and each define patentable subject matter. A Notice of Allowance is therefore respectfully requested.

Enclosed is a check in the amount of $84 for one independent claim in excess of the number previously paid for. No other fees are believed to be payable with this communication. Nevertheless, should the Examiner consider any other fees to be payable in conjunction with this or any future communication, the Director is authorized to direct payment of such fees, or credit any overpayment to Deposit Account No. 50-1170.

The Examiner is invited to contact the undersigned by telephone if it would help expedite matters.

Respectfully submitted,

Timothy Newholm
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Dated: January 24, 2003

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Amended Claims

1. (Twice Amended) An exciter assembly for a vibratory roller, comprising:

(A) an exciter housing;

(B) an exciter shaft rotatably journaled in said exciter housing;

(C) a fixed eccentric weight rotationally fixed to said exciter shaft;

(D) a rigid free swinging eccentric weight mounted on said exciter shaft so as to rotate as a unit with respect to said exciter shaft between 1) a first angular position in which the eccentricity of said rigid free swinging eccentric weight adds to the eccentricity of said fixed eccentric weight and 2) a second angular position in which the eccentricity of said rigid free swinging eccentric weight detracts from the eccentricity of said fixed eccentric weight, wherein said rigid free swinging eccentric weight is mounted on said exciter shaft so as to be restrained from substantial axial movement along said exciter shaft without the use of any retaining structure that is fixed to said rigid free swinging eccentric weight, and wherein said rigid free swinging eccentric weight is disposed between an axial end of said fixed eccentric weight and another component of said exciter assembly that is fixed to said exciter shaft, and wherein said rigid free swinging weight is restrained from substantial axial movement along said exciter shaft solely by said fixed eccentric weight and said another component of said exciter assembly.

4. (Amended) ~~The exciter assembly as recited in claim 1~~An exciter assembly for a vibratory roller, comprising:

(A) an exciter housing;

(B) an exciter shaft rotatably journaled in said exciter housing;

(C) a fixed eccentric weight rotationally fixed to said exciter shaft;

(D) a rigid free swinging eccentric weight mounted on said exciter shaft so as to rotate as a unit with respect to said exciter shaft between 1) a first angular position in which the eccentricity of said rigid free swinging eccentric weight adds to the eccentricity of said fixed eccentric weight and 2) a second angular position in which the eccentricity of said rigid free swinging eccentric weight detracts from the eccentricity of said fixed eccentric weight, wherein said rigid free swinging eccentric weight is mounted on said exciter shaft so as to be restrained from substantial axial movement along said exciter shaft without the use of any retaining structure that is fixed to said rigid free swinging eccentric weight,

wherein said free swinging eccentric weight is sandwiched between a first end of said fixed eccentric weight and a component comprising one of a torque transfer element and a bearing that is axially spaced from said fixed eccentric weight, and

wherein said free swinging eccentric weight has a tab that extends over an adjacent axial end of said fixed eccentric weight and that engages a first side of said fixed eccentric weight when said free swinging eccentric weight is in said first angular position and that engages a second side of said fixed eccentric weight when said free swinging eccentric weight is in said second angular position.

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12. (Twice Amended) An exciter assembly that is configured to impart vibrations to a rotating drum assembly of a vibratory roller, comprising:

(A) an exciter housing which is formed integrally with an axle housing of the rotating drum assembly;

(B) an exciter shaft which is rotatably journaled in said exciter housing by at least first and second bearings;

(C) a fixed eccentric weight which is rotationally fixed to said exciter shaft;

(D) a first free swinging eccentric weight which is sandwiched between a first end of said fixed eccentric weight and said first bearing and which is restrained from substantial axial movement along said exciter shaft solely by said fixed eccentric weight and said first bearing;

(E) a second free swinging eccentric weight 1) which is sandwiched between ~~said first~~ a second end of said fixed eccentric weight and a component consisting of a) said second bearing and b) a torque transfer element fixed to said exciter shaft and 2) which is restrained from substantial axial movement along said exciter shaft solely by said fixed eccentric weight and said component.

25. (Amended) The method as recited in claim ~~24~~20, wherein at least some of the fixing steps comprise pressing the associated components onto said exciter shaft.

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26. (Twice Amended) The method as recited in claim ~~24~~20, wherein the step of fixing said fixed eccentric weight to said exciter shaft comprises forming said fixed eccentric weight integrally with said exciter shaft.

27. (Twice Amended) A method comprising:

(A) assembling an exciter assembly by

(1) fixing a torque transfer element and a bearing to an exciter shaft ~~without using any hardware~~,

(2) fixing an eccentric weight to said exciter shaft ~~without using any mounting hardware~~,

(3) mounting first and second free swinging eccentric weights on said exciter shaft adjacent respective ends of said fixed eccentric weight so as to be rotatable a limited amount relative to said exciter shaft, and

(4) restraining said first and second free swinging eccentric weights from substantial axial movement along said exciter shaft solely by sandwiching said first and second free swinging eccentric weights between respective ends of said fixed eccentric weight and operative components of said exciter assembly, each of said operative components comprising one of said bearing and said torque transfer element; then

(B) inserting said exciter assembly axially into an opening in an exciter housing and mounting said exciter assembly in said exciter housing;

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(C) mounting said exciter assembly on a trench roller in operative communication with a rotatable drum assembly that supports said trench roller on a surface to be compacted.

31. (Amended) An exciter assembly for a vibratory roller, comprising:

(A) an exciter housing;

(B) an exciter shaft rotatably journaled in said exciter housing;

(C) a fixed eccentric weight rotationally fixed to said exciter shaft;

(D) a rigid free swinging eccentric weight mounted on said exciter shaft so as to rotate as a unit with respect to said exciter shaft between 1) a first angular position in which the eccentricity of said rigid free swinging eccentric weight adds to the eccentricity of said fixed eccentric weight and 2) a second angular position in which the eccentricity of said rigid free swinging eccentric weight detracts from the eccentricity of said fixed eccentric weight, wherein said rigid free swinging eccentric weight is mounted on said exciter shaft so as to be restrained from substantial axial movement along said exciter shaft without the use of any retaining structure that is fixed to said free swinging eccentric weight,

wherein said rigid free swinging eccentric weight is restrained from substantial axial movement along said exciter shaft solely by two separate exciter components that are individually ~~mounted~~fixed to said exciter shaft on opposite sides of said free swinging eccentric weight in a non-abutting relationship relative to one another.

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